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Koji Masaki

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

KRYLOVA, IRINA

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Attachment to Advisory Action

1. Applicant's response filed on September 2, 2009 has been fully considered but is not persuasive.

2. Regarding the rejection of claims 1-12 and 15-16 under 35 U.S.C. 103(a) as being unpatentable over **Nakagawa et al** in JP 2003253051, Applicant argues that **Nakagawa et al** discloses a rubber composition comprising (A) 100 parts by mass of a styrene-butadiene copolymer having a weight average molecular weight of 400,000 to 3,000,000 and (B) 10-200 parts by mass of styrene-butadiene copolymer having a weight average molecular weight of 5,000 to 200,000 and a bound styrene content of 25-70% by mass, wherein not less than 60% of a double bond in butadiene portion of the styrene-butadiene copolymer (B) is hydrogenated, wherein since hydrogenation reaction mainly occurs at the vinyl bond, all of the unhydrogenated double bonds are not vinyl bonds and the content of the vinyl bond in the styrene-butadiene copolymer is about 0%.

3. Examiner disagrees.

Nakagawa et al discloses that 60% or more of double bond of butadiene portion of styrene-butadiene copolymer is hydrogenated. Therefore, 40% or less of double bond of butadiene portion is non-hydrogenated. Reaction of hydrogenation occurs at all unsaturated double bonds. The kinetics of the hydrogenation of different double bonds may be different, but nevertheless, 60% of hydrogenated double bonds would obviously

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include all kinds of hydrogenated double bonds, and therefore, out of 40% of non-hydrogenated double bond, as disclosed by **Nakagawa et al**, at least 10% would be non-hydrogenated vinyl bond.

4. Regarding the rejection of claims 1-2, 5-9, 13-16 under 35 U.S.C. 103(a) as being unpatentable over **Fujimaki et al** in US 4,866,131, Applicant argues that **Fujimaki et al** discloses a low molecular weight copolymer having a MW of 2,000 to 50,000, whereas the instant invention has a weight average molecular weight of more than 50,000 but not more than 300,000. Further, **Fujimaki et al** teaches that if the molecular weight of the copolymer is above 50,000, the resultant rubber does not sufficiently augment the hysteresis loss value. Therefore, **Fujimaki et al** teaches away from the invention. Also, one skilled in the art would not expect that the processability and the loss factor can be decreased by using an aromatic vinyl compound-diene compound copolymer having an average weight molecular weight of more than 50,000 but no more than 300,000 based on the disclosure of **Fujimaki et al**.

5. Examiner disagrees.

1) Fujimaki et al discloses a rubber composition comprising an aromatic vinyl-diene copolymer having molecular weight of 2,000-50,000, wherein the composition comprises large hysteresis loss value (col. 1, lines 42-45). This correlates to the high loss factor values of the copolymer (B) having molecular weight 4,000; 25,000 and 40,000, given in Table 2 of the instant specification. Then **Fujimaki et al** states that if

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the molecular weight of the copolymer increases, the rubber composition does not augment (i.e. does not increase) in the hysteresis loss value. Therefore, **Fujimaki et al** discloses the trend of the results given in Table 2 of the instant invention because as the molecular weight of the copolymer (B) increases, the loss factor value decreases.

2) As stated in analysis of the Declaration 37 C.F.R. 1.132, which was adequately set forth on pages 9-10 of the Office Action mailed on June 2, 2009 and is incorporated here by reference, comparing Loss factor of the styrene-butadiene copolymer (B) having molecular weight of 40,000 and 51,000 and higher, it is evident from the Table 2 that the Loss factor decreases with the increase of the molecular weight.

However, it is known in the art that: in polymers of the same composition (including polymers of butadiene) tan delta at 60°C decreases with increasing polymer molecular weight. Therefore, the lowering of the loss value of the copolymer (B) with the increase of the molecular weight of the copolymer (B) is an expected result.

6. All non-statutory obviousness double patenting rejections, that were adequately set forth on pages 11-15 of the Office Action mailed on June 2, 2009 and are incorporated here by reference, are maintained since no Terminal Disclaimers were filed by the Applicant.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irina Krylova whose telephone number is (571)270-7349. The examiner can normally be reached on Monday-Friday 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasudevan Jagannathan can be reached on (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Irina Krylova/
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796